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10/801,838	03/17/2004	Naohiro Ueda	R2180.0193/P193	3147
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EXAMINER				
KALAM, ABUL				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/801,838

**Applicant(s)**

UEDA, NAOHIRO

**Examiner**

Abul Kalam

**Art Unit**

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 January 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 and 17-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 17-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. **Claims 1, 2, 4-6 and 19** are rejected under 35 U.S.C. 102(b) as being anticipated by **Rodriguez et al. (US 5,821,160, previously cited, hereinafter, Rodriguez)**.

With respect to **claim 1**, **Rodriguez** teaches a semiconductor apparatus (**FIG. 7**) comprising:

a semiconductor substrate (**12, FIG. 7**);

an electrode pad (**54; col. 6: Ins. 48-50**) comprising a metal layer and formed over the semiconductor substrate (**12**), said electrode pad providing contact between said semiconductor apparatus and external circuitry (**col. 6: Ins. 48-53; it is implicit that “bond pads” provide contact between an integrated circuit and external circuitry**);

a MOS transistor (**NMOS**) formed over the semiconductor substrate (**col. 3: Ins. 59-61, col. 4: Ins. 35-52**); and

a circuit (**FIG. 7; col. 3: Ins. 59-61**) formed over said semiconductor substrate (**12**) in a region under the electrode pad (**54**), said circuit comprising a plurality of

resistive elements (**42; col. 5: Ins. 28-29, 34-36**) formed of a semiconductor material (**col. 2: Ins. 47-49: "polysilicon is also used to form resistive elements such as resistors"**), said electrode pad (**54**) being formed over said plurality of resistive elements (**col. 2: Ins. 47-59; col. 6: Ins. 48-55**).

Note that regarding the limitation of "providing contact between said semiconductor apparatus and external circuitry," an apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Schreiber*, 128 F.3d 1473, 1477-78, 44USPQ2d 1429, 1431-32 (Fed. Cir. 1997) (The absence of a disclosure in a prior art reference relating to function did not defeat the Board's finding of anticipation of claimed apparatus because the limitations at issue were found to be inherent in the prior art reference); see also *In re Swinehart*, 439 F.2d 210 212-13, 169 USPQ 226, 228-29 (CCPA 1971); *In re Danly*, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). "Apparatus claims cover what a device is, not what a device does." *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990).

With respect to **claim 2**, **Rodriguez** teaches the semiconductor apparatus as set forth in claim 1 above, wherein the resistive elements comprise polysilicon (**col. 2: Ins. 47-49, col. 4: Ins. 28-29**).

With respect to **claim 4**, **Rodriguez** teaches the semiconductor apparatus as set forth in claim 1 above, wherein the MOS transistor (**NMOS**) comprises a gate electrode (**21; FIG. 2**) which comprises polysilicon (**col. 4: Ins. 13-23**).

With respect to **claim 5, Rodriguez** teaches the semiconductor apparatus as set forth in claim 1 above, further comprising:

an insulating film **(32)** formed on the semiconductor substrate **(12)** in a region in a vicinity of the electrode pad **(54)** (**FIG. 7; col. 4: Ins. 42-47**); and

a fuse element **(36)** formed on the insulating film **(32)**, said fuse element in electrical contact with said plurality of resistive elements (**col. 4, Ins. 53-67; col. 2: Ins. 40-51**).

With respect to **claim 6, Rodriguez** teaches the semiconductor apparatus as set forth in claims 1 and 5 above, wherein the fuse element **(36)** comprises polysilicon (**col. 4, Ins. 53-67**).

With respect to **claim 19, Rodriguez** teaches a semiconductor apparatus comprising:

a semiconductor substrate **(12, FIG. 7)**;

an oxide film **(38, FIG. 7)** formed over the semiconductor substrate **(12)**, the oxide film comprising a resistive-element formation region (**region where 42 is formed; col. 5: Ins. 25-45**), a fuse element formation region (**region where 36 is formed; col. 5: Ins. 34-41**), and a MOS transistor forming region (**region where NMOS transistor is formed; col. 4: Ins. 35-52**) including a MOS transistor comprising a gate electrode formed of polysilicon (**col. 4: Ins. 14-24**), the resistive element forming region having a circuit comprising a plurality of resistive elements formed of a semiconductor material (**col. 2: Ins. 47-51**);

an insulating layer (**58; col. 6: Ins. 45-47**) formed over the oxide film (**38, FIG. 7**) and having an electrode-pad formation region (**region where 54 is formed; col. 6: Ins. 48-53**),

wherein the electrode-pad formation region (**region where 54 is formed; col. 6: Ins. 48-53**) is formed over the resistive-element formation region (**region where 42 is formed; col. 5: Ins. 25-45**), and wherein the electrode-pad formation region has an electrode pad (**54; col. 6: Ins. 48-50**) comprising a metal layer.

2. **Claims 1-4 and 17** are rejected under 35 U.S.C. 102(b) as being anticipated by **Takasu et al. (US 6,369,409, previously cited, hereinafter, Takasu)**.

With respect to **claim 1, Takasu** teaches a semiconductor apparatus (**FIG. 12A-12F**) comprising:

a semiconductor substrate (**801; FIG. 12A, col. 8: Ins. 9-10**);

an electrode pad (**814, col. 9: Ins. 44-58**) including a metal layer ("**aluminum,**" **col. 9: In. 44**) and formed over the semiconductor substrate (**801, FIG. 12E**), said electrode pad providing contact between said semiconductor apparatus and external circuitry (**FIGs. 9 and 10**) (**col. 9: Ins. 44-52; it is implicit that the aluminum "wiring" provides contact between an integrated circuit and external circuitry**);

a MOS transistor ("**N-type transistor**") formed over the semiconductor substrate (**col. 9: Ins. 23-28**); and

a circuit (**FIGs. 9, 10 and 12F**) formed over said semiconductor substrate (**801**) in a region under the electrode pad (**814**), said circuit comprising a plurality of resistive

elements (**807**; **FIG. 12D**) formed of a semiconductor material ("**polysilicon**") (**col. 9: Ins. 28-67**), said electrode pad ("**bonding pad**," **814**) being formed over said plurality of resistive elements (**807**; **FIG. 12D-12F**).

Note that regarding the limitation of "providing contact between said semiconductor apparatus and external circuitry," an apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Schreiber*, 128 F.3d 1473, 1477-78, 44USPQ2d 1429, 1431-32 (Fed. Cir. 1997) (The absence of a disclosure in a prior art reference relating to function did not defeat the Board's finding of anticipation of claimed apparatus because the limitations at issue were found to be inherent in the prior art reference); see also *In re Swinehart*, 439 F.2d 210 212-13, 169 USPQ 226, 228-29 (CCPA 1971); *In re Danly*, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). "Apparatus claims cover what a device is, not what a device does." *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990).

With respect to **claim 2**, **Takasu** teaches the semiconductor apparatus as set forth in claim 1 above, wherein the resistive elements (**807**) comprise polysilicon (**col. 9: Ins. 28-30**).

With respect to **claim 3**, **Takasu** teaches the semiconductor apparatus as set forth in claim 1 above, wherein the resistive elements (**807**) include a plurality of resistors connected serially (**807**; **FIGs. 12D-12F**) (**col. 9: Ins. 28-33, 56-58**).

With respect to **claim 4, Takasu** teaches a semiconductor apparatus as set forth in claim 1 above, wherein the MOS transistor ("**N-type transistor**") comprises a gate electrode (**806; FIG. 12D**) which comprises polysilicon (**col. 9: Ins. 10-15**).

With respect to **claim 17, Takasu** teaches the semiconductor apparatus as set forth in claim 1 above, wherein the resistive elements includes a plurality of doped semiconductor material resistors (**807; FIG. 12D**) (**col. 9: Ins. 10-33**).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claim 7** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Rodriguez ('160)** as applied to claim 5 above, and further in view of **Matsuzaki et al. (US 2002/0063262, previously cited, hereinafter, Matsuzaki)**.

With respect to **claim 7, Rodriguez** teaches all the limitations of the claim, as set forth above in claim 1, with the exception of disclosing:

a rerouting layer formed in a region above the fuse element; and  
an external connection terminal formed on the rerouting layer in a region different from a formation region of the electrode pad.



However, **Matsuzaki** teaches a semiconductor apparatus (**FIG. 3**) wherein a rerouting layer (**148**) is formed in a region above a fuse element (**142**; **pg. 5: [0093]**); and an external connection terminal (**150**) is formed on the rerouting layer in a region different from a formation region of the electrode pad (**143**) (**pg. 4: [0080]-[0081]**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the device of **Rodriguez** to include a rerouting layer and external connection terminal on the rerouting layer, as taught by **Matsuzaki**, for the disclosed intended purpose of connecting the semiconductor apparatus to an electrode of another chip, thereby forming a multi-chip apparatus (**pg. 4: [0082]**).

4. **Claims 8-10** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Rodriguez** ('**160**) as applied to claim 5 above, and further in view of **Tsuchida (US 6,232,823, previously cited)**.

With respect to **claim 8**, **Rodriguez** teaches the semiconductor apparatus as set forth in claim 5 above, with the exception of disclosing:

wherein the circuit comprises a voltage setting circuit, the resistive elements comprise at least two resistors for producing a split voltage based on an input source power voltage, and the voltage setting circuit changes the split voltage according to a condition of the fuse element.

However, **Tsuchida** teaches voltage setting circuit (**fig. 1**), in which a resistive elements comprise at least two resistors (**22, 23, 24, 25, 26**) for producing a split voltage based on an input source power voltage (**21**), and the voltage setting circuit

changes the split voltage according to a condition of the fuse element (27, 28, 29, 30) (col. 7: Ins. 7-64).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the semiconductor apparatus of **Rodriguez** to include a voltage setting circuit, as taught by **Tsuchida**, for the disclosed intended purpose of providing a voltage setting circuit, in which the number of choices in the output voltage is increased while suppressing the increase of an area occupied by resistors (col. 2, Ins. 24-27).

With respect to **claim 9**, **Rodriguez** teaches the semiconductor apparatus as set forth in claim 1 above, and **Tsuchida** teaches (fig. 6) wherein the resistive elements comprise at least two resistors (22, 23, 24, 25, 26) for producing a split voltage (col. 11: Ins. 51-55; col. 7: 45-64) based on an input source power voltage (53), the circuit comprises a reference voltage generator (51) for generating a reference voltage (col. 11: Ins. 61-63) and a voltage detector including a comparator (52) for performing a comparison of the split voltage with the reference voltage (col. 11: Ins. 50-67; col. 12, Ins. 1-33). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of **Rodriguez** with the teachings **Tsuchida**, for the reasons stated above in claim 8.

With respect to **claim 10**, **Rodriguez** and **Tsuchida** teach the semiconductor apparatus as set forth in claim 9 above, and **Tsuchida** also teaches (fig. 6) wherein the apparatus further comprises an output driver (54) for controlling an output voltage (55) based on an input voltage (53), and the comparator (52) of the voltage detector outputs

a gate control voltage (“**operation voltage**”) as a result of the comparison for controlling the output driver (**54**) to control the output voltage (**col. 11, Ins. 61-67; col. 12, Ins. 1-5**). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of **Rodriguez** with the teachings **Tsuchida**, for the reasons stated above in claim 8.

5. **Claims 18 and 21** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Rodriguez** (“**160**”) as applied to claims 4 and 19, respectively, and further in view of **Kohda et al. (US 5,107,313, previously cited, hereinafter, Kohda)**.

With respect to **claims 18 and 21**, **Rodriguez** teaches all the limitations of the claims, as set forth above in claims 4 and 19, with the exception of explicitly disclosing wherein said gate electrode has lengthwise ends which are bent in an upward direction over an oxide film.

However, **Khoda** teaches a semiconductor apparatus wherein the gate electrode (**4b**) has lengthwise ends which are bent in an upward direction over an oxide film (**2**) (**FIG. 10; col. 6, Ins. 6-12**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of **Rodriguez** to form the gate electrode with lengthwise ends bent in upward direction over an oxide film, as taught by **Khoda**, for the disclosed intended purpose of reducing the horizontal spacing between the gates, which thereby reduces the cell area and leads to a higher cell density of memory devices (**col. 6: Ins. 21-24**).

6. **Claim 20** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Rodriguez ('160)** as applied to claim 19, respectively, and further in view of **Takasu ('409)**.

With respect to **claim 20**, **Rodriguez** teaches all the limitations of the claims, as set forth above in claim 19, with the exception of disclosing wherein a respective low resistance polysilicon region is formed immediately next to the lengthwise ends of each of the plurality of resistive elements.

However, **Takasu** discloses a semiconductor apparatus (**FIG. 12D**) wherein a respective low resistance polysilicon region (**808**) is formed immediately next to the lengthwise ends of each of the plurality of resistive elements (**809, FIG. 12D; col. 9: Ins. 20-30**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of **Takasu** into the invention of **Rodriguez**, thus forming low resistance polysilicon regions at the ends of the resistive elements, for the purpose of providing conductive contact regions for the resistive elements .

***Response to Arguments***

7. Applicant's arguments filed January 24, 2008, have been fully considered but are not persuasive.

With respect to claim 1 and the Rodriguez reference, Applicant argues:

"The figures in Rodriguez do not illustrate the 'bond pads.' The Office action first contends that this argument, mad earlier, is not persuasive but contradicts this contention by later conceding that Rodriguez does not disclose the bond pads in the figures."

The argument is not persuasive because, limitations can be disclosed in the figures and/or specification of a reference. Rodriguez clearly states in col. 6, lines 48-55, that the bond pads (electrode pad) are formed from metal layer 54, which is formed over the semiconductor substrate 12 and resistive elements 42 (col. 2: ln. 48-49), as shown in Fig. 7. Although the etch processing to expose the bond pads is not illustrated in Fig. 7 (col. 6: lns. 48-49), the metal layer 54 which functions as the electrode pad, is clearly illustrated and described by Rodriguez (col. 39-50). Applicant's statement that "Rodriguez discloses a metal layer 54 which is etched to form "bond pad areas," is incorrect because Rodriguez states that the "etch processing is performed to expose bond pads...formed from metal 54 (col. 6: lns. 48-50)." Thus, metal 54 functions as the electrode pad. Regarding Applicant's statement that "the Office Action fails to respond to the Applicant's earlier arguments," it is unclear what arguments the Applicant is referring to.

With respect to claim 1 and the Takasu reference, Applicant argues that "Takasu does not disclose 'bond pads' which are formed over the polysilicon resistors 807."

The argument is not persuasive, because wiring 814 which is formed of a metal layer or pad (col. 9: lns. 44-52) and functions as "electrode" for electrically connecting to the resistors, and thus, the aluminum layer 814 functions as an "electrode pad". Furthermore, aluminum 814 is formed over the polysilicon resistors 807 (FIG. 12F). FIGs. 1-3 also illustrates that electrode pads are formed from aluminum wirings 201-204, over polysilicon resistors 105-107.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Abul Kalam whose telephone number is 571-272-8346. The examiner can normally be reached on Monday - Friday, 9 AM - 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. K./  
Examiner, Art Unit 2814

/Phat X Cao/  
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